

**Principles of Mathematics 10: All Domains
Item-Level Response Reports (Provincial Level)**

British Columbia

All Schools

June/2009

Provincial Principles of Mathematics 10 Item-Level Response Reports include data for all BC students who wrote the exam in June 2009 (about 26,355 students). Both public and independent schools are included. The Principles of Mathematics 10 June 2009 provincial Item-Level Response Report All Domains displays the proportion of students who made errors on each exam item. Separate tables indicate results for Multiple Choice items for each domain: Number, Patterns and Relations, Shape and Space, as well as Numerical Responses.

Click [here](#) to view the Prescribed Learning Outcomes

1. Question type: MC

Domain: Number

Form	Item #	Question type	Prescribed Learning Outcomes	Number of Students who Responded to the Item	Percentage of Students who Answered Incorrectly	Specific Curricular Aspect that Needs Attention [$>20\%$ selected incorrect response]
A	1	MC	A1	26338	27%	*
A	2	MC	A2	26337	70%	<ul style="list-style-type: none"> Students did not know that an integer does not have decimals.
A	3	MC	A4	26307	12%	<ul style="list-style-type: none"> N/A
A	4	MC	A4	26259	23%	*
A	5	MC	A4	26338	29%	*
A	6	MC	A4	26193	56%	<ul style="list-style-type: none"> Students recognized the need to rationalize the denominator of a fraction involving radicals, but made a sign error.

A	8	MC	A4	25979	58%	<ul style="list-style-type: none"> In a problem involving two right triangles with a common height, students applied the Pythagorean Theorem to determine the height and the base, but then calculated the perimeter of the triangle instead of the area.
A	9	MC	A5	26347	26%	*
A	10	MC	A5	25979	36%	*
A	11	MC	A5	26258	47%	*
A	12	MC	A6	26237	73%	<ul style="list-style-type: none"> When simplifying a product of powers involving fractional exponents, students did not distribute the exponent to the coefficient in the bracket. When simplifying a product of powers involving fractional exponents, students incorrectly applied an exponent to both variable and coefficient.
A	13	MC	A6	26237	59%	<ul style="list-style-type: none"> Students correctly multiplied two monomials involving exponents and radicals, but thought that a negative exponent means to take the reciprocal of the fractional exponent.
A	14	MC	A6	26180	51%	<ul style="list-style-type: none"> When simplifying a power involving rational exponents and radicals, students added two of the exponents rather than multiplying.

Note:

(1) A description of the misconception is given when more than 20% of students answered the item incorrectly (i.e. selected a distractor).

(2) 'N/A' indicates that fewer than 20% of students answered the item incorrectly. Therefore, no description is provided.

(3) '*' indicates that more than 20% of students answered the item incorrectly, but no single distractor was selected by more than 20% of the students. Therefore, no description is provided.

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2. Question type: MC

Domain: Patterns and Relations

Form	Item #	Question type	Prescribed Learning Outcomes	Number of Students who Responded to the Item	Percentage of Students who Answered Incorrectly	Specific Curricular Aspect that Needs Attention [$>20\%$ selected incorrect response]
A	16	MC	B1	26332	10%	<ul style="list-style-type: none"> N/A
A	17	MC	B1	26233	24%	<ul style="list-style-type: none"> *
A	18	MC	B2	26257	19%	<ul style="list-style-type: none"> N/A
A	19	MC	B2	26199	77%	<ul style="list-style-type: none"> Students could not find a correct expression for the total number of items in a row pattern forming an arithmetic sequence.
A	21	MC	B12	26309	23%	<ul style="list-style-type: none"> *
A	22	MC	B12	26289	41%	<ul style="list-style-type: none"> *
A	23	MC	B12	26231	47%	<ul style="list-style-type: none"> Students understood how to substitute in a function notation, but made a mistake when distributing a coefficient into a binomial.
A	24	MC	B13	26327	69%	<ul style="list-style-type: none"> Students misinterpreted the y-intercept to be the slope of a horizontal line. Students did not recognize that a horizontal line has '0' rather than 'undefined' slope.
A	25	MC	B13	26327	33%	<ul style="list-style-type: none"> *

A	26	MC	B13	26310	48%	<ul style="list-style-type: none"> Students made an algebraic mistake when converting the equation of a line from standard form to slope-intercept form and did not obtain the correct values for slope and x-intercept.
A	27	MC	B13	26319	59%	<ul style="list-style-type: none"> When given the equation of a horizontal line, students stated the range rather than domain of the graph.
A	28	MC	B14	26241	59%	<ul style="list-style-type: none"> Students did not know how to write the equation of a line in slope-intercept form and find the sign for slope and y-intercept; they matched the equation to a graph with the right slope but the incorrect y-intercept.
A	29	MC	B16	26314	12%	<ul style="list-style-type: none"> N/A
A	31	MC	B4	26317	30%	*
A	32	MC	B4	26257	40%	<ul style="list-style-type: none"> Students incorrectly factored an expression containing a difference of perfect squares by not taking the square roots of the coefficients.
A	34	MC	B5	26310	56%	<ul style="list-style-type: none"> When simplifying an algebraic expression, students made an error because they did not distribute the negative sign to all terms in a bracket.
A	35	MC	B5	26297	29%	*
A	36	MC	B6	26250	52%	<ul style="list-style-type: none"> Students did not recognize the components of a division statement and they thought that the ratio

						between remainder and divisor was the remainder.
A	37	MC	B6	26261	45%	<ul style="list-style-type: none"> When dividing two polynomials, students did not recognize that the dividend is missing an 'x' term and therefore ended up collecting unlike terms.
A	38	MC	B7	26322	34%	<ul style="list-style-type: none"> When dividing a polynomial to a monomial, students thought that the ratio of two identical terms is '0'.
A	39	MC	B7	26291	39%	*
A	40	MC	B7	26294	43%	*
A	42	MC	B9	26302	27%	*
A	43	MC	B9	26247	57%	<ul style="list-style-type: none"> When dividing two rational expressions, students did not take the reciprocal of the second fraction and made a sign error.
A	44	MC	B9	26003	70%	<ul style="list-style-type: none"> In a word problem involving the addition of two rational expressions, students made an algebraic error by not distributing properly a coefficient into a binomial. In a word problem involving the addition of two rational expressions, students added a constant term to the numerator of the second fraction without writing the two expressions with a common denominator. In a word problem involving the addition of two rational expressions, students incorrectly cancelled the quadratic and constant terms of the top and bottom trinomials and next collected the like

						terms.
A	45	MC	B10	26219	41%	*

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3. Question type: MC

Domain: Shape and Space

Form	Item #	Question type	Prescribed Learning Outcomes	Number of Students who Responded to the Item	Percentage of Students who Answered Incorrectly	Specific Curricular Aspect that Needs Attention [$>20\%$ selected incorrect response]
A	46	MC	C1	26070	45%	<ul style="list-style-type: none"> In a problem involving two right triangles, students correctly found the missing angle but then used the tangent ratio rather than the sine ratio to find the length of the hypotenuse.
A	47	MC	C3	26284	27%	*
A	48	MC	C3	26038	52%	<ul style="list-style-type: none"> Students incorrectly used the Pythagorean Theorem to find the unknown side in a non right triangle.
A	50	MC	C3	26214	36%	*
A	51	MC	C4	26270	30%	*

A	52	MC	C4	26131	73%	<ul style="list-style-type: none"> Students incorrectly applied the formula to determine the distance between two points by adding the x-coordinates and the y-coordinates. Students correctly applied the formula to determine the distance between two points to find the diagonal of a square but did not know how to obtain the side length of the square or forgot to perform this last step.
A	53	MC	C5	26254	27%	*
A	54	MC	C6	26265	27%	*
A	56	MC	C7	26257	51%	<ul style="list-style-type: none"> Students did not recognize that the equation of a vertical line does not contain the variable y.
A	57	MC	C7	26276	54%	<ul style="list-style-type: none"> When asked to determine the equation in standard form of a line, given the slope and x-intercept, students made sign errors or guessed.
A	58	MC	C7	26206	40%	*
A	59	MC	C8	26278	44%	<ul style="list-style-type: none"> Students correctly identified the slope of a line parallel with another line but could not find the y-intercept.
A	60	MC	C8	26268	76%	<ul style="list-style-type: none"> Students selected an equation of a line perpendicular to a given line, but the line did not pass through a given point as required.

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4. Question type: Numerical Responses

Form	Item #	Domain	Prescribed Learning Outcomes	Number of Students who Responded to the Item	Percentage of Students who Answered Incorrectly	Specific Curricular Aspect that Needs Attention
A	7	Number	A4	26354	29	Students did not know how to evaluate radicals with a negative radicand or an index greater than 2 or made arithmetic errors when adding two radicals.
A	15	Number	A3	26352	43	Students did not know how to use the calculator to evaluate a radical and/or how to take the reciprocal of the result and/or did not give the result with two decimal places.
A	20	Patterns and Relations	B11	26354	25	When given three points representing a linear function, students did not know how to find the y -coordinate of a fourth point, given its x -coordinate.
A	30	Patterns and Relations	B16	26353	24	Students did not know how to compute total weekly earnings involving a base salary and commission for sales and/or did not give the result at the nearest dollar.
A	33	Patterns and Relations	B4	26351	55	Students did not know what a perfect square trinomial is and/or did not know how to use the middle term to find the unknown value for one perfect square in the trinomial.
A	41	Patterns and Relations	B8	26352	54	Students did not know the meaning of non-permissible values of a rational expression and/or made a mistake in solving a linear equation to find the value for which the expression was undefined.
A	49		C2	26352	37	Students did not know how to solve a trigonometric

		Shape and Space				equation and/or did not know how to use the calculator to find an angle with a given cosine and/or did not know the properties of the cosine ratios for obtuse angles and/or did not give the result to the nearest degree.
A	55	Shape and Space	C6	26352	62	Students did not know how to obtain the slope of a line using the values of the intercepts and/or did not know how to work out the slope-intercept form of the equation of a line and/or made a numerical mistake in solving a linear equation.